Listing of Claims

The following listing of claims will replace all prior versions, and listings, of claims in the subject application:

Claims 1-69 (canceled)

70. (currently amended) An optical transmission module, including a semiconductor light emitting device, said semiconductor light emitting device comprising:

~~said module comprising:~~

a semiconductor ~~light emitting device~~ substrate;

an active region comprising a strained quantum well layer; and

a cladding layer for confining carriers and light emissions,

wherein ~~said semiconductor light emitting device is as claimed in any one of claims 1 through 17~~ an amount of lattice strains in said quantum well layer is in excess of 2% against either said semiconductor substrate or said cladding layer.

71. (currently amended) An optical transmitter receiver module, including a semiconductor light emitting device, said semiconductor light emitting device comprising:

~~said module comprising:~~

a semiconductor ~~light emitting device~~ substrate;

an active region comprising a strained quantum well layer; and

a cladding layer for confining carriers and light emissions,

wherein ~~said semiconductor light emitting device is as claimed in any one of claims 1 through 17~~ an amount of lattice strains in said quantum well layer is in excess of 2% against either said semiconductor substrate or said cladding layer.

72. (currently amended) An optical communication system, including a semiconductor light emitting device, said semiconductor light emitting device comprising:

~~said module comprising:~~

a semiconductor ~~light emitting device~~ substrate;

an active region comprising a strained quantum well layer; and

a cladding layer for confining carriers and light emissions,

wherein ~~said semiconductor light emitting device is as claimed in any one of claims 1 through 17~~ an amount of lattice strains in said quantum well layer is in excess of 2% against either said semiconductor substrate or said cladding layer.

Claims 73 and 74 (canceled)

75. (new) The optical transmission module according to claim 70, wherein a thickness of said quantum well layer is in excess of a critical thickness calculated by a relationship of Matthews and Blakeslee.

76. (new) The optical transmission module according to claim 70, wherein said semiconductor substrate is composed of GaAs.

77. (new) The optical transmission module according to claim 70, wherein said strained quantum well layer is composed of $Ga_x In_{1-x} N_y As_{1-y}$ $(0 \leq x \leq 1, 0 \leq y < 1)$.

78. (new) The optical transmission module according to claim 77, wherein said strained quantum well layer composed of $Ga_x In_{1-x} N_y As_{1-y}$ $(0 \leq x \leq 1, 0 \leq y < 1)$ is characterized to have a photoluminescence peak wavelength of at least 1.12 micron for GaInAs (y=0).

79. (new) The optical transmission module according to claim 77, wherein the In content in said strained quantum well layer is at least 30% of group-III elements included therein.

80. (new) The optical transmission module according to claim 77, wherein the N content in said strained quantum well layer is from 0% to 1% of group-V elements included therein.

81. (new) The optical transmission module according to claim 70, wherein a plane orientation of said semiconductor substrate is in a (100) direction with an allowable deviation of at most 5°.

82. (new) The optical transmission module according to claim 70, wherein said cladding layer is composed of either GaInP or GaInPAs.

83. (new) The optical transmission module according to claim 70, further comprising a barrier layer provided in a vicinity of said strained quantum well layer to relax the strains therein.

84. (new) The optical transmission module according to claim 70, wherein said semiconductor light emitting device is a surface emitting type device.

85. (new) The optical transmission module according to claim 84, further comprising:

a first mirror region formed adjacent to said semiconductor substrate, a quantum well active region formed thereon, comprising said strained quantum well layer; and

a second mirror region formed on an opposite side of said active region from said first mirror region, to collectively constitute an optical cavity for achieving stimulated light emissions,

wherein at least said first mirror region is constructed to have a periodic multi-layered structure of thin semiconductor layers with alternating higher and lower refractive indices.

86. (new) The optical transmission module according to claim 84, further comprising:

a first mirror region formed adjacent to said semiconductor substrate, a quantum well active region formed thereon, comprising said strained quantum well layer; and

a second mirror region formed on an opposite side of said active region from said first mirror region, to collectively constitute an optical cavity for achieving stimulated light emissions,

wherein at least said first mirror region is constructed to have a periodic multi-layered structure of thin semiconductor layers with alternating higher and lower refractive indices, in which said thin semiconductor layers are characterized as to contain no Al.

87. (new) The optical transmission module according to claim 84, further comprising;

a first mirror region formed adjacent to said semiconductor substrate, a quantum well active region formed thereon, comprising said strained quantum well layer; and

a second mirror region formed on an opposite side of said active region from said first mirror region, to collectively constitute an optical cavity for achieving stimulated light emissions,

wherein at least said first mirror region is constructed to have a periodic multi-layered structure of thin dielectric layers with alternating higher and lower refractive indices.

88. (new) The optical transmission module according to claim 70, wherein said strained quantum well layer is formed at temperatures of at most 600° C.

89. (new) The optical transmission module according to claim 70, wherein said light emitting device comprises III-V alloy semiconductor layers formed by metal organic

chemical vapor deposition (MOCVD) using organic compounds as the source material for the III-group elements.

90. (new) The optical transmission module according to claim 70, wherein said strained quantum well layer is formed using nitrogen containing organic compounds selected from the group consisting of dimethylhydrazine and monomethylhydrazine.

91. (new) The optical transmitter receiver module according to claim 71, wherein a thickness of said quantum well layer is in excess of a critical thickness calculated by a relationship of Matthews and Blakeslee.

92. (new) The optical transmitter receiver module according to claim 71, wherein said semiconductor substrate is composed of GaAs.

93. (new) The optical transmitter receiver module according to claim 71, wherein said strained quantum well layer is composed of $Ga_x In_{1-x} N_y As_{1-y} (0 \leq x \leq 1, 0 \leq y < 1)$.

94. (new) The optical transmitter receiver module according to claim 93, wherein said strained quantum well layer composed of $Ga_x In_{1-x} N_y As_{1-y} (0 \leq x \leq 1, 0 \leq y < 1)$ is characterized to have a photoluminescence peak wavelength of at least 1.12 micron for GaInAs (y=0).

95. (new) The optical transmitter receiver module according to claim 93, wherein the In content in said strained quantum well layer is at least 30% of group-III elements included therein.

96. (new) The optical transmitter receiver module according to claim 93, wherein the N content in said strained quantum well layer is from 0% to 1% of group-V elements included therein.

97. (new) The optical transmitter receiver module according to claim 71, wherein a plane orientation of said semiconductor substrate is in a (100) direction with an allowable deviation of at most 5°.

98. (new) The optical transmitter receiver module according to claim 71, wherein said cladding layer is composed of either GaInP or GaInPAs.

99. (new) The optical transmitter receiver module according to claim 71, further comprising a barrier layer provided in a vicinity of said strained quantum well layer to relax the strains therein.

100. (new) The optical transmitter receiver module according to claim 71, wherein said semiconductor light emitting device is a surface emitting type device.

101. (new) The optical transmitter receiver module according to claim 100, further comprising:

a first mirror region formed adjacent to said semiconductor substrate, a quantum well active region formed thereon, comprising said strained quantum well layer; and

a second mirror region formed on an opposite side of said active region from said first mirror region, to collectively constitute an optical cavity for achieving stimulated light emissions,

wherein at least said first mirror region is constructed to have a periodic multi-layered structure of thin semiconductor layers with alternating higher and lower refractive indices.

102. (new) The optical transmitter receiver module according to claim 100, further comprising:

a first mirror region formed adjacent to said semiconductor substrate, a quantum well active region formed thereon, comprising said strained quantum well layer; and

a second mirror region formed on an opposite side of said active region from said first mirror region, to collectively constitute an optical cavity for achieving stimulated light emissions,

wherein at least said first mirror region is constructed to have a periodic multi-layered structure of thin semiconductor layers with alternating higher and lower refractive indices, in which said thin semiconductor layers are characterized as to contain no Al.

103. (new) The optical transmitter receiver module according to claim 100, further

comprising;

a first mirror region formed adjacent to said semiconductor substrate, a quantum well active region formed thereon, comprising said strained quantum well layer; and

a second mirror region formed on an opposite side of said active region from said first mirror region, to collectively constitute an optical cavity for achieving stimulated light emissions,

wherein at least said first mirror region is constructed to have a periodic multi-layered structure of thin dielectric layers with alternating higher and lower refractive indices.

104. (new) The optical transmitter receiver module according to claim 71, wherein said strained quantum well layer is formed at temperatures of at most 600° C.

105. (new) The optical transmitter receiver module according to claim 71, wherein said light emitting device comprises III-V alloy semiconductor layers formed by metal organic chemical vapor deposition (MOCVD) using organic compounds as the source material for the III-group elements.

106. (new) The optical transmitter receiver module according to claim 71, wherein said strained quantum well layer is formed using nitrogen containing organic compounds selected from the group consisting of dimethylhydrazine and monomethylhydrazine.

107. (new) The optical communication system according to claim 72, wherein a

thickness of said quantum well layer is in excess of a critical thickness calculated by a relationship of Matthews and Blakeslee.

108. (new) The optical communication system according to claim 72, wherein said semiconductor substrate is composed of GaAs.

109. (new) The optical communication system according to claim 72, wherein said strained quantum well layer is composed of $Ga_x In_{1-x} N_y As_{1-y} (0 \leq x \leq 1, 0 \leq y < 1)$.

110. (new) The optical communication system according to claim 109, wherein said strained quantum well layer composed of $Ga_x In_{1-x} N_y As_{1-y} (0 \leq x \leq 1, 0 \leq y < 1)$ is characterized to have a photoluminescence peak wavelength of at least 1.12 micron for GaInAs (y=0).

111. (new) The optical communication system according to claim 109, wherein the In content in said strained quantum well layer is at least 30% of group-III elements included therein.

112. (new) The optical communication system according to claim 109, wherein the N content in said strained quantum well layer is from 0% to 1% of group-V elements included therein.

113. (new) The optical communication system according to claim 72, wherein a

plane orientation of said semiconductor substrate is in a (100) direction with an allowable deviation of at most 5°.

114. (new) The optical communication system according to claim 72, wherein said cladding layer is composed of either GaInP or GaInPAs.

115. (new) The optical communication system according to claim 72, further comprising a barrier layer provided in a vicinity of said strained quantum well layer to relax the strains therein.

116. (new) The optical communication system according to claim 72, wherein said semiconductor light emitting device is a surface emitting type device.

117. (new) The optical communication system according to claim 116, further comprising:

a first mirror region formed adjacent to said semiconductor substrate, a quantum well active region formed thereon, comprising said strained quantum well layer; and

a second mirror region formed on an opposite side of said active region from said first mirror region, to collectively constitute an optical cavity for achieving stimulated light emissions,

wherein at least said first mirror region is constructed to have a periodic multi-layered structure of thin semiconductor layers with alternating higher and lower refractive indices.

118. (new) The optical communication system according to claim 116, further comprising:

a first mirror region formed adjacent to said semiconductor substrate, a quantum well active region formed thereon, comprising said strained quantum well layer; and

a second mirror region formed on an opposite side of said active region from said first mirror region, to collectively constitute an optical cavity for achieving stimulated light emissions,

wherein at least said first mirror region is constructed to have a periodic multi-layered structure of thin semiconductor layers with alternating higher and lower refractive indices, in which said thin semiconductor layers are characterized as to contain no Al.

119. (new) The optical communication system according to claim 116, further comprising;

a first mirror region formed adjacent to said semiconductor substrate, a quantum well active region formed thereon, comprising said strained quantum well layer; and

a second mirror region formed on an opposite side of said active region from said first mirror region, to collectively constitute an optical cavity for achieving stimulated light emissions,

wherein at least said first mirror region is constructed to have a periodic multi-layered structure of thin dielectric layers with alternating higher and lower refractive indices.

120. (new) The optical communication system according to claim 72, wherein said strained quantum well layer is formed at temperatures of at most 600° C.

121. (new) The optical communication system according to claim 72, wherein said light emitting device comprises III-V alloy semiconductor layers formed by metal organic chemical vapor deposition (MOCVD) using organic compounds as the source material for the III-group elements.

122. (new) The optical communication system according to claim 72, wherein said strained quantum well layer is formed using nitrogen containing organic compounds selected from the group consisting of dimethylhydrazine and monomethylhydrazine.